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DrägerService®

Dräger

Field Service Procedure

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KIT, TEC 6 DESFLURANE VAPORIZER INSTALLATION, NAD VARIANT

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KIT, TEC 6 DESFLURANE VAPORIZER INSTALLATION, NAD VARIANT

INSTALLATION PROCEDURE

NOTE: The following procedure is performed after all host NARKOMED Anesthesia Systems have been upgraded, if applicable, in accordance with TSB #103.

NOTE: The desflurane vaporizer shall be installed in the extreme right position (as viewed from the front) on the machine.

NOTE: If the host machine is a NARKOMED 4, its gas analyzer must be configured to include desflurane. Refer to Service Procedure SP00117 for details.

If the host machine is a NARKOMED 3, its gas analyzer must be configured to include desflurane. Refer to Service Procedure SP00121 for details.

NOTE: Proceed to Step 5 if you are not removing an existing vaporizer.

1. Before removing an existing vaporizer or bypass block from the machine, perform a low pressure leak test at the fresh gas outlet to verify gas circuit integrity.

2. If there is an existing vaporizer in place, it must be drained and dried as follows:

CAUTION

The following steps must be performed in the sequence given.

2.1 Activate the waste gas scavenger system.

2.2 Attach a breathing bag to the bag mount connector.

2.3 Open the APL valve by turning it fully counter-clockwise.

2.4 Short circuit the inspiratory and expiratory valves with a 22 mm hose.

2.5 Ensure that the fresh gas hose is connected to the 15 mm connector on the machine.

2.6 Turn the System Power switch to ON.

2.7 Set all vaporizer handwheels to their Zero or OFF position.

WARNING

Do not inhale anesthetic vapors as this could result in personal injury.

INSTALLATION PROCEDURE (continued)

2.8 Open the filler and drain plugs, and drain the vaporizer into a suitable container. Dispose of the residual agent in an approved manner.

2.9 Close the filler and drain plugs.

2.10 Turn the vaporizer handwheel to the maximum concentration setting.

2.11 Set the oxygen flow to 10 l/min. for at least 20 minutes.

2.12 Turn the vaporizer handwheel to 0 (zero), turn the oxygen flow off and set the System Power switch to STANDBY.

3. While holding the vaporizer, remove the mounting screws and carefully separate the vaporizer from the machine.

4. Place the vaporizer in a suitable container for transport or storage.

5. Remove the desflurane vaporizer from its packing container and inspect the vaporizer for damage.

6. Verify that the dial (handwheel) is set to Standby.

7. Place an O-ring (supplied by the vaporizer manufacturer) in each recess of the mounting surface of the vaporizer.

WARNING

DO NOT use the Dräger O-rings when installing the desflurane vaporizer. The Dräger O-rings may cause occlusion of the gas passages when used with desflurane.

8. Secure the vaporizer to the machine with two 35 mm long screws (Ohmeda supplied by the vaporizer manufacturer). See Figure 1.

WARNING

If the Desflurane vaporizer is later removed from the machine and a Dräger vaporizer installed in its place, DO NOT use the Ohmeda screws or the Ohmeda O-rings to mount the Dräger vaporizer. The longer Ohmeda screws will bottom out and will not allow a gas tight seal between the Dräger vaporizer and the machine.

INSTALLATION PROCEDURE (continued)

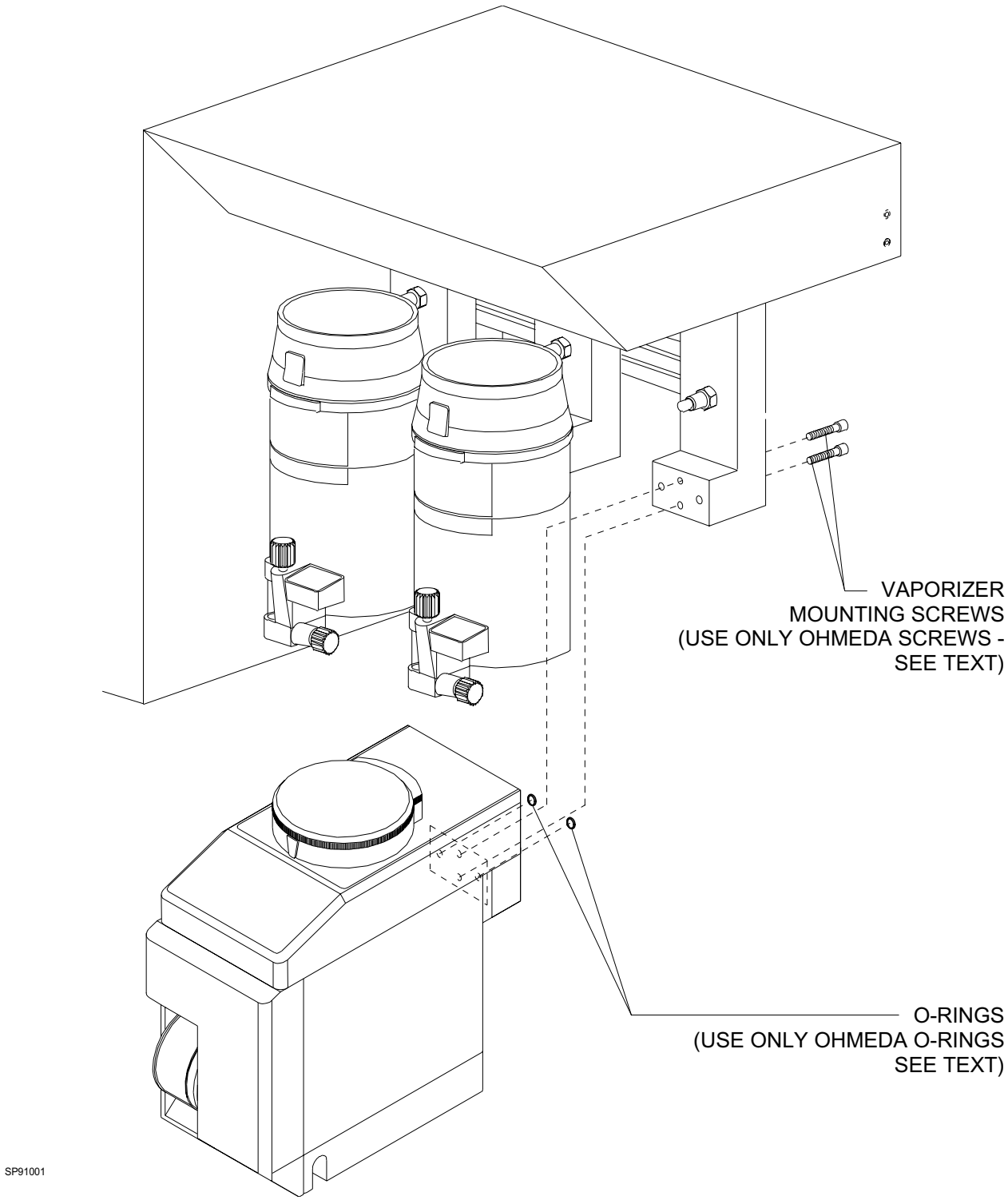

Figure 1: DESFLURANE VAPORIZER INSTALLATION

INSTALLATION PROCEDURE (continued)

9. Test the long pivot arm of the vaporizer interlock assembly with a magnet. If the pivot arm is magnetic, skip to Step 14.

NOTE: Unused pivot arms may be returned to:

North American Dräger
Technical Service Department
3122 Commerce Drive
Telford, PA 18969

Attn: Desflurane Coordinator

10. Remove the upper retaining clip securing the center pivot pin to the vaporizer interlock assembly. See Figure 2.

11. Slide the pin out from the assembly (do not misplace the two spacers) and remove the long pivot arm.

12. Transfer the two locking hex nuts and the two set screws from the existing pivot arm to the new pivot arm included in the Desflurane Installation Kit.

13. Assemble the new pivot arm onto the interlock assembly as follows: Slide the pivot pin up into the lower support bar, place a spacer on the pin, place the new pivot arm onto the pin, slide the pin up through the pivot arm, place another spacer on the pin and continue sliding the pin through the upper support bar. Secure the pin to the assembly with the retaining clip

14. Attach the desflurane warning label (included in the Desflurane Installation Kit) to the right side of sloping front vapor box panel. (Choose another location on the sloping front panel if the right side is already occupied by another label.)

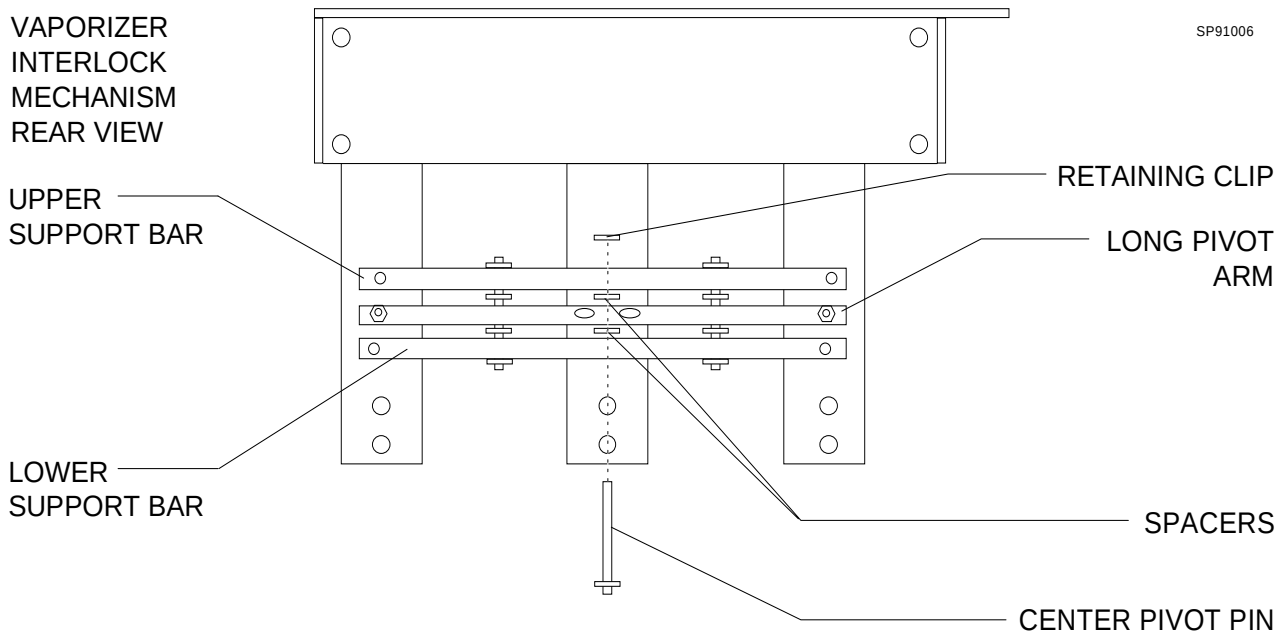

Figure 2: INTERLOCK MECHANISM - LONG PIVOT ARM INSTALLATION

INSTALLATION PROCEDURE (continued)

15. Remove the AC line cord retainer plate from the bottom of the vaporizer. Insert the AC line cord firmly into the socket of the vaporizer and route the cord through the channel as indicated in Figure 3.

    Open the retainer loop on the back of the vaporizer and snap the cord into the loop.

    Reinstall the AC line cord retainer plate.

CAUTION

DO NOT use the convenience receptacle on the Narkomed machine.

16. Plug the vaporizer line cord into an AC receptacle.

UNDERSIDE VIEW OF DESFLURANE VAPORIZER

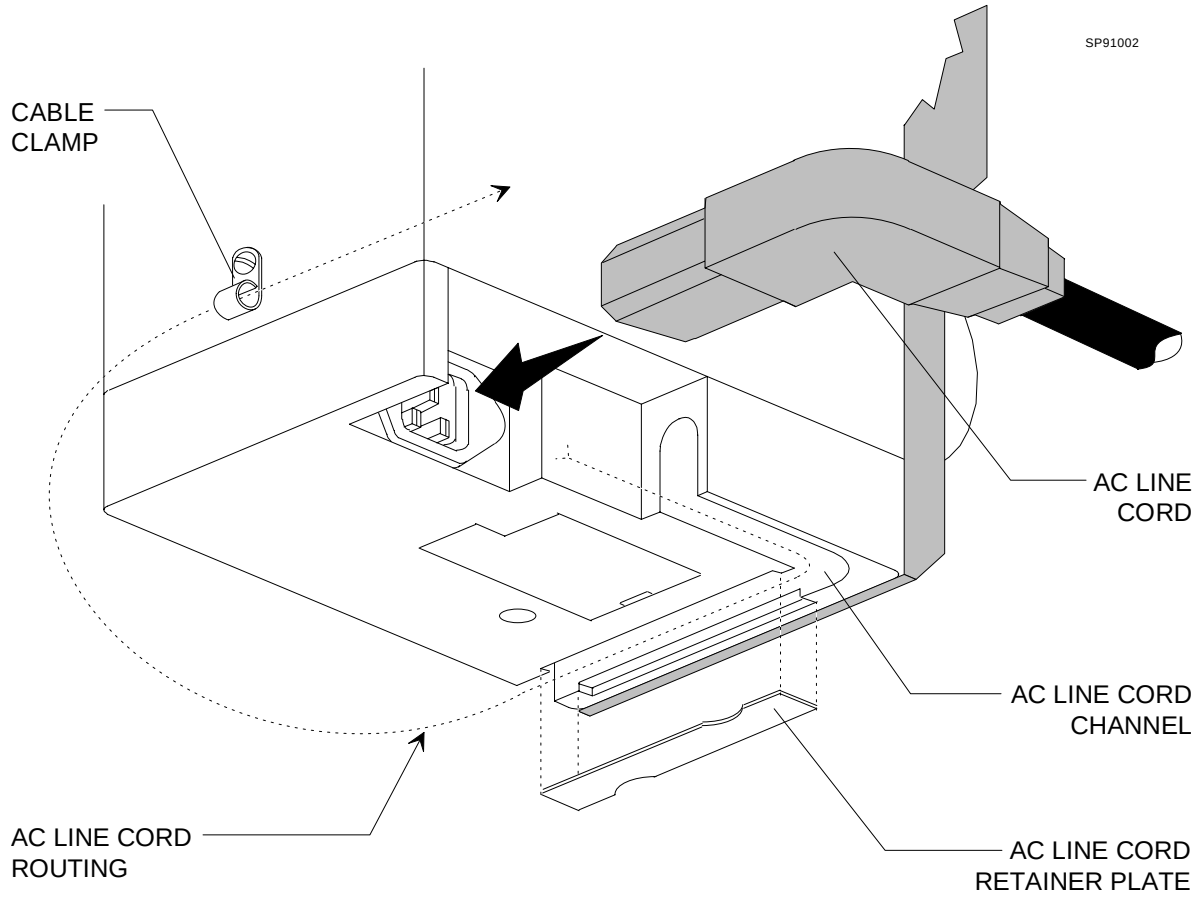

Figure 3: DESFLURANE VAPORIZER AC LINE CORD INSTALLATION

TEST PROCEDURE

1. Perform the "Alarm and Display Test" and "Preoperative Checkout" as described in the Datex-Ohmeda Tec 6 or Tec 6 Plus Operation and Maintenance Manual supplied with the vaporizer. NOTE: If this information is not available contact the manufacturer.

Vaporizer Exclusion System Adjustment:

WARNING

To ensure proper operation of the vaporizer exclusion system with the desflurane vaporizer and its dial overload mechanism, it is imperative that each step of the vaporizer exclusion system adjustment procedure be followed exactly as written.

2. Turn on the left mounted vaporizer by depressing the "0" button while turning the handwheel.

3. Depress the "0" button on the center mounted vaporizer and verify that the vaporizer can not be turned on. Also verify that there is a minimal amount of "free play" in the handwheel and the interlock mechanism. If adjustment is required, tighten set screw Ⓐ (see Figure 4) until the vaporizer locks without "free play".

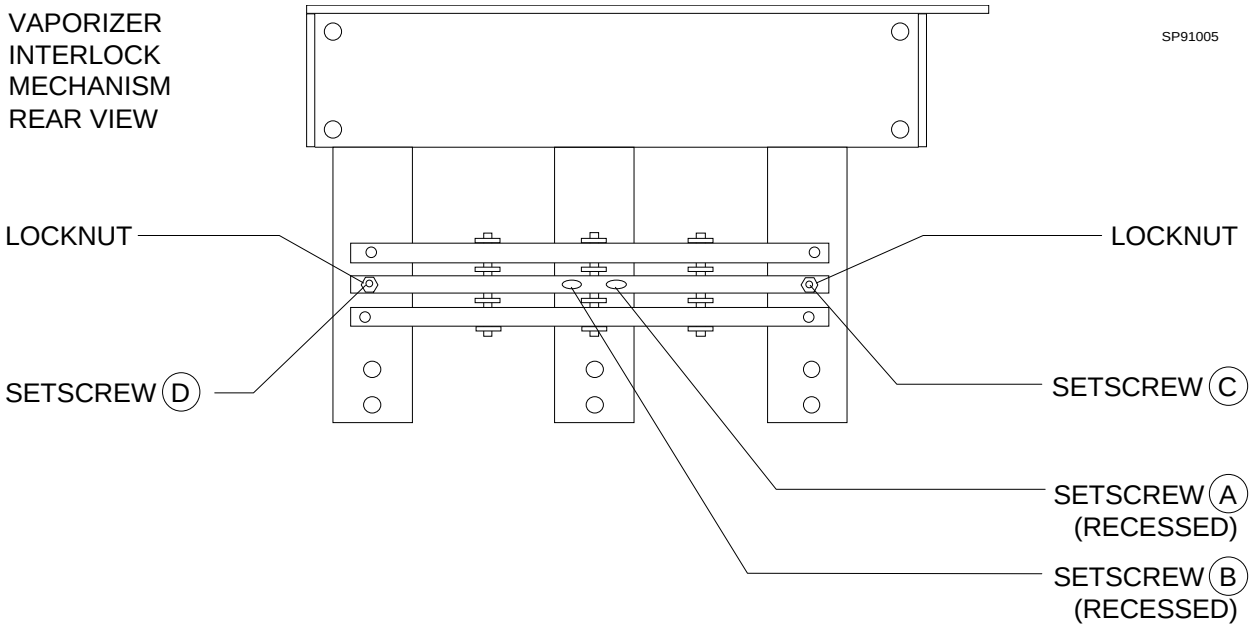

Figure 4: VAPORIZER INTERLOCK ADJUSTMENT

TEST PROCEDURE (continued)

NOTE: Do not over-tighten the set screw. Each vaporizer handwheel or dial must turn easily while the other vaporizers are locked.

4. Turn off the left mounted vaporizer, and turn on the center mounted vaporizer. Check the left vaporizer for "free play" as in Step 3. Turn off the center vaporizer.

5. Turn on the desflurane vaporizer by fully depressing the dial release, then rotating the dial.

6. Loosen the lock nut securing set screw Ⓒ or Ⓓ on the long pivot arm (see Figure 4), and back out the set screw several turns.

7. Re-tighten the set screw to just eliminate play from the left mounted vaporizer, then back out the set screw ½ revolution counter-clockwise.

7A. While depressing its "0" button, verify that the vaporizer can not be turned on. Secure the lock nut while holding the set screw to maintain correct adjustment.

8. Turn the desflurane vaporizer dial to STANDBY.

9. Turn on the left mounted vaporizer by depressing its "0" button while turning the handwheel - just far enough to engage the vapor exclusion system.

10. Attempt to turn on the desflurane vaporizer by applying torque to the dial while slowly squeezing the dial release. Verify that the dial release collapses without allowing the dial to be turned on. Repeat this check three more times with the handwheel of the left mounted vaporizer at ⅓, ⅔ and full on. See table below for equivalent handwheel settings.

Repeat Steps 5 thru 10 if necessary to obtain correct operation of the desflurane vaporizer dial.

NOTE: If the unit can not be successfully adjusted, contact the NAD Technical Service Department.

10A. Loosen the lock nut securing set screw Ⓒ or Ⓓ on the long pivot arm (see Figure 4), and turn in the set screw ½ revolution clockwise.

11. Turn off the left mounted vaporizer.

12. Turn on the desflurane vaporizer by fully depressing the dial release, and then rotating the dial.

Vaporizer	Just On	⅓ On	⅔ On	Full On
Halothane	<0.2%	0.4%	2%	5%
Enflurane	<0.3%	1%	3.5%	7%
Isoflurane	<0.2%	0.4%	2%	5%

TEST PROCEDURE (continued)

NOTE: If the interlock assembly is adjusted so that there is too much force on the desflurane vaporizer, an overload mechanism within the dial will prevent the vaporizer from being activated.

Repeat Steps 2 thru 10 if the note applies.

13. Turn the desflurane vaporizer dial to STANDBY.

13A. Repeat Steps 9 and 10 to verify the integrity of the adjustment.

13B. Turn off the left mounted vaporizer.

14. Turn on the desflurane vaporizer by fully depressing the dial release, then rotating the dial.

15. Back out set screw Ⓑ several turns. See Figure 4.

16. Re-tighten the set screw to just eliminate play from the center mounted vaporizer, then back out the set screw ½ revolution counter-clockwise.

16A. While depressing its "0" button, verify that the vaporizer can not be turned on.

17. Turn the desflurane vaporizer to STANDBY.

18. Turn on the center mounted vaporizer by depressing its "0" button while turning the handwheel - just far enough to engage the vapor exclusion system.

19. Attempt to turn on the desflurane vaporizer by applying torque to the dial while slowly squeezing the dial release. Verify that the dial release collapses without allowing the dial to be turned on. Repeat this check three more times with the handwheel of the center mounted vaporizer at ⅓, ⅔ and full on. Refer to the table for equivalent handwheel settings.

Repeat Steps 14 thru 19 if necessary to obtain correct operation of the desflurane vaporizer dial.

NOTE: If the unit can not be successfully adjusted, contact the NAD Technical Service Department.

19A. Turn in set screw Ⓑ ½ revolution clockwise, and repeat Steps 18 and 19.

20. Turn off the center mounted vaporizer.

21. Turn on the desflurane vaporizer by fully depressing the dial release, and then rotating the dial.

NOTE: If the interlock assembly is adjusted so that there is too much force on the desflurane vaporizer, an overload mechanism within the dial will prevent the vaporizer from being activated.

Repeat Steps 13B thru 19 if the note applies.

TEST PROCEDURE (continued)

22. Turn the desflurane vaporizer to STANDBY.

22A. Repeat Steps 18 and 19 to verify the integrity of the adjustment.

23. After final adjustment has been made on the exclusion system, verify that the agent indicator lamps (if applicable) operate correctly for all three vaporizers.

Leak Test:

1. Connect a pressure gauge and squeeze bulb to the fresh gas outlet. Pressurize the system to 50 cm H_2O. After 30 seconds the pressure drop shall not be more than 10 cm H_2O.

2. Turn the desflurane vaporizer dial to 1% and repeat the leak test given in the previous step. Press the dial release, adjust the setting to 18% and repeat the test.

3. Turn off all vaporizers and flow control valves, and turn the System Power switch to STANDBY. Ensure that the Ventilator Power switch is OFF.

TEST PROCEDURE (continued)

Desflurane Vaporizer Concentration Test:

1. Verify that the Riken Gas Indicator bears a current calibration sticker.
2. Zero the Riken Gas Indicator Model 18D as per its operator's manual.
3. Insert a 15 mm male x 15 mm female elbow into the fresh gas outlet.
4. Connect a sampling tee between the elbow and the fresh gas hose 15 mm connector of the absorber.
5. Connect a ¼ in. teflon hose between the sampling tee and the inlet of the Riken Gas Indicator Model 18D.
6. Turn the APL valve knob counter-clockwise to its fully open position.
7. Attach a short 22 mm hose between the inspiratory and expiratory valves.
8. Attach a breathing bag to the swivel bag mount connector.
9. Set the oxygen flow rate to 10 l/min. to flush the system of residual gases.
10. Reduce the oxygen flow rate to 5.0 l/min.
11. Verify that the Riken Gas Indicator Model 18D indicates 0.0% vol. and re-zero if needed.
12. Turn the desflurane dial to the 4% setting.
13. Draw a gas sample into the Riken Gas Indicator Model 18D and read the gas volume % per the operator's manual. Record the reading on the desflurane vaporizer concentration verification form.
14. Verify that the value obtained is within the sum of tolerances of the Riken Gas Indicator Model 18D and the vaporizer. (Refer to the desflurane vaporizer concentration verification form for High and Low limits.) Place a check mark in the appropriate Pass/Fail box on the form.
15. Repeat the previous three steps at desflurane vaporizer dial settings of 6%, 10%, 12%, and 16%.

TEST PROCEDURE (continued)

Narkomed 4 Gas Analyzer Configuration

If the desflurane vaporizer is installed on a Narkomed 4, the machine's gas analyzer must be configured for desflurane as follows:

1. Turn the System Power switch to ON.
2. Access the Main Service Screen by pressing and holding the Selection Dial, and simultaneously press the MONITOR and SYSTEM CONFIG keys.
3. Select the Service Mode and enter your Technical Service Representative ID number.
4. Enter the Secondary Service Screen and touch the DES Agent selection key to allow desflurane. Touch the Right vaporizer position key, select and enter DES. Touch the EXIT key to return to the Main Service Screen.
5. Press the MONITOR key on the main key panel to return to normal viewing.
6. Turn the System Power switch to STANDBY, then back to ON.
7. Verify that the DES notation appears on the agent monitor display.
8. Turn the System Power switch to STANDBY.

Narkomed 3 Gas Analyzer Configuration (if applicable)

If the desflurane vaporizer is installed on a Narkomed 3, the machine's gas analyzer must be configured for desflurane as follows:

1. Turn the System Power switch to ON while simultaneously pressing the ▼ and ▲ keys on the multispec monitor. The multispec display window will show 02.
2. Turn the desflurane vaporizer dial on.
3. Press the AGENT SELECT key until the letter "D" appears in the display window.
4. Press the DISPLAY key on the multispec monitor.
5. Turn off the desflurane vaporizer.
6. Turn the System Power switch to STANDBY, then back to ON.
7. Press the DATA key. Turn on the desflurane vaporizer and verify that the "DES" abbreviation appears in the expiratory and inspiratory agent locations.
8. Turn off the desflurane vaporizer and turn the System Power switch to STANDBY.

PARTS REQUIRED

PART DESCRIPTION: Field Install	PART NUMBER
Kit, Desflurane Installation, includes:	S010188
Long Pivot Arm	4108043
Installation Procedure for Tec 6 Desflurane Vaporizer	SP00091
Desflurane Warning Label	4112737-001

TEST EQUIPMENT REQUIRED

DESCRIPTION	PART NUMBER
Riken Gas Indicator	Model 18D
Bulb & Hose Assembly	4109398
Tee for 5/32 ID Tube	4109292
Tube, Corr. 22 mm x 12 in. lg.	9995112
Digital Pressure Manometer	SenSym PDM 200CD or equivalent
Magnet	4110277 or equivalent

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DESFLURANE VAPORIZER CONCENTRATION VERIFICATION

Customer _____ AHA #_____

Address _____ Dealer_____

City _____ State _____ Zip _____

PO # _____ Machine Serial # _____ Vaporizer Serial # _____

Machine Model _____

Dial Setting	Low Lim. Tolerance	High Lim. Tolerance	Pass	Fail
4%	3.28%	4.72%		
6%	4.92%	7.08%		
10%	8.20%	11.8%		
12%	9.84%	14.16%		
16%	13.12%	18.88%		

Comments_____

_____

_____

Service Representative:	I.D. No.:	Date:

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